[Irish Children.]

IRISH SKETCHES.—No. IV.

WATER-CARRIERS.

It is difficult to estimate all we have lost to the picturesque by the introduction of a New River or a West Middlesex Water Company—the graceful forms which haunted the approach to every spring or conduit—graceful always, as the act of carrying any vessel on the head compels a strict regard to the motion, and renders it "sober, steadfast, and demure." The groups scattered round waiting each its turn, talking over the news of the district,—the failings or misfortunes, the joys or sorrows of their neighbours and friends—the old to recall the past—the young to speculate on the future—the grandmother to look after her grandchildren, each with a vessel proportioned to its powers—the child to tend the steps of its blind grandfather—the lover accidentally calling to drink at the moment his mistress has been led to the spot in her care for the good of others—where the dogs and children of the neighbourhood, having been to drink, remain to play—all combine to render the spot the most attractive in its locality.

In Ireland this innovation on the picturesque has by no means become universal, and consequently the well or the burn has still its attractive groups of young and old carrying, in vessels of every shape and material, this great *indispensable*, and where the wildness of the dress gives the frequent beauty of such spots its full effect and animation.

The group at the head of this notice was a portion of a party so occupied in the neighbourhood of Cork—the scene was further enlivened by parties of women engaged in washing and beating linen in the stream, while others were drying it on the spot or carrying it off on their heads to a more convenient place for the same purpose.

ON MODEL-MAPPING OR RELIEF-MAPS.

It is familiarly known to those who are in the habit of consulting the best maps, that an attempt is there made to represent inequalities in the level of the ground by peculiar modes of introducing engraved lines. A range of mountains, for instance, is represented by leaving white or nearly white the parts whereon light may be supposed to fall; and throwing into dark shadow, by a thick congregation of lines, the spot

which may represent the opposite declivity of the range. This is commonly done to a certain extent in all maps, except those of a very inferior kind; and in maps of high character, such as those resulting from the Ordnance Surveys of England and Ireland, an endeavour is made to represent the greater or less degrees of elevation by a greater or less depth of shadow.

But all such attempts fail to convey vividly to the mind a correct idea of the inequalities of level exhibited by the country mapped out; and when the map is to be used as the basis of engineering operations, such as those in which the level of streams and lakes is concerned, the defect becomes of greater importance. Hence have originated various plans, attended with more or less success, having for their object the representation of districts in *relief*, by constructing copies which occupy a medium place between models and maps, and may therefore be conveniently termed "model-maps."

The representation of objects in which the height bears a notable proportion to the horizontal extent has been of old effected by means of models; but the raised representation of a district which, however diversified in level whenever viewed by the eye, bears in elevation but a small ratio to its extent, has not been brought prominently into notice until recently. Military engineers have been in the habit of constructing models of celebrated fortresses, mountain forts, and other fortified forts, with a view of illustrating, more clearly than can be effected by maps, the general bearing of the various operations connected with military proceedings. For instance, whoever has visited the United Service Museum, in Whitehall Place, may have seen a model of part of the Island of St. Vincent, with the fortifications erected on it; and another, as much as six or seven feet square, of the intrenched camp at Linz in Upper Austria, executed on a scale of one inch to a hundred yards, and exhibiting the undulations of the ground, together with the positions of all the several parts of the intrenchment. Again, the Rotunda, or Military Repository, at Woolwich, exhibits numerous specimens of this class of models; independent of model-plans of the dockyards at Deptford, Chatham, Woolwich, Portsmouth, and Plymouth, there are models of many noted fortresses, such as that of Gibraltar, in which the height and the horizontal dimensions bear the same relation to each other in the model as in nature. The United Service Museum contains also two specimens of that which comes more under the denomination of model-mapping, viz., a French relief-map of the district of Neufchatel, and an English relief-map of Edinburgh; each map presenting approximately the inequalities in the level of the district depicted. But perhaps the most extraordinary production of this kind ever yet produced was the model or relief-map of the field of Waterloo, exhibited in London a few years ago. This model exhibited, on a surface of four hundred and twenty square feet, the whole field of Waterloo, with all the diversified features of the spot—fields of grass and standing corn, woods, vineyards, gardens, hedges, trees, fallow lands—all represented at such elevations, and with such contours of surface, as were analogous to those exhibited in nature. The two hundred thousand minutely modelled figures of soldiers and horses we do not here particularly refer to, but to the mode of representing the physical features of a district.

The importance of model-mapping, hitherto confined principally to military matters, is now beginning to attract attention in reference to irrigation and draining, as well as to the most important departments of civil engineering. Mr. Denton, who has devised a mode of constructing model-maps, and has written a small work on the subject, remarks:—"Draining would obviously be rendered easier in design, and more practicable in execution, if the operator had before him the resemblance, in accurate dimensions, of each rise and fall of the ground; and the capability of systematizing the drainage of the different tenantcies, so that they might be made subservient to one general order of drainage, would by such reference be simplified. For example,—in the model-map the lower grounds of an estate or district being shown in depression, the course of all main drains or sewers would have to be directed through such depressions, and all other drains and sewers would be collaterally arranged and worked into them with accuracy and facility. This observation applies to all ground and property where draining can be effected." In these model-maps the object is to show not only the undulations of the ground, but all the houses, buildings, woods, hedges, mounds, and hollows, by appropriate elevations and cavities; every portion of land being represented, so that when coloured it may indicate the state of husbandry at that spot. In such a map the relative levels of different parts may be ascertained by taking a horizontal plane at a given distance above the model, and letting fall perpendiculars from that plane to the model, which perpendiculars will be longer or shorter according as the surface is more or less depressed, and may be compared with a scale in such a manner as to give the relative elevations of the different parts.

The substance of which these models or model-maps may be made affords scope for extended inquiry. Each manufacturer or patentee probably uses some material which he deems most fitting, and which, in most cases, he keeps to a certain extent secret. Cork has been much employed for the construction of models, from its lightness, its durability, and the ease with which it may be cut: this was, we believe, the material of which the model of the battle of Waterloo was formed. If a mould were formed of the object to be represented, then a cast might be obtained from this mould in any of the usual substances, such as plaster of Paris, or sulphur, or wax, or clay, or any other plastic or fusible material; but if the object be produced by modelling, then the material must be such as will admit of being cut with knives and chisels, and worked with blunt tools. The determination of these two circumstances must obviously depend on the purpose for which the model-map is intended; whether it is to be for the use of one party only, or to be diffused, like books or prints, by multiplied copies. For example, if a model of a fortress or fortified town were required as a military curiosity, only one such would be necessary, and this one would be modelled by hand out of such materials as might be deemed most proper for that purpose. But if a relief-map of a district were published, this would be regarded somewhat in the light of a published print or map, of which many copies have to be sold before the expenses can be repaid. In such case each individual copy would not be modelled, but moulded, or stamped, or pressed: a mould or a die (according to the nature of the method) being first prepared, in which cavities are represented by projections and projections by cavities. We may take as instances two remarkable relief-maps lately published in London, one a map of London, and the other a map of Europe. In these maps all raised portions of ground are represented by raised portions of the maps, the ground or base-plane of the map being so chosen as to allow depth for all the depressions to be represented. Now, in these cases, the maps are published, at so much per copy, a price being charged which could not possibly be sufficient to defray the expense of modelling each one individually; and therefore a mould is first made, or cast from the original model, and impressions taken from this mould;

or else a die is made, which is stamped on some plastic material (for we are speaking rather of the general principles of such productions, than of any one particular method).

The spread of the use of relief-maps or model-maps will thus be a good deal dependent on the employment of some apt material for the cast and impression. Within the last few years a new material has come extensively into use in architectural decorations, which seems calculated to be very valuable in this respect, and which indeed has, we believe, already been used for that purpose; we mean *papier-maché*. Everybody is now familiar with the beautiful examples of embossed drawing-board, card-board, and pasteboard which afford such evident proofs of the facility with which paper and pasteboard will receive impressions from a die or stamp; but the use of odd fragments of coarse paper for a similar purpose—or rather, for the formation of coarser and stouter devices—is not so generally known. Boyle in the last century made use of a remark which shows that a substance analogous to papier-maché was known in his day; he says:—"Though paper be one of the commonest bodies that we use, there are very few that imagine it is fit to be employed other ways than in writing, or printing, or wrapping up of other things, or about some such obvious piece of service, without dreaming that frames of pictures and divers fine pieces of embossed work, with other curious moveables, may, as trial has informed us, be made of it." The name applied to this material would seem to indicate that it is of French origin; but in an article in the 'Encyclopédie Méthodique,' written about half a century ago, the material is referred to as in use in England, thus—"The English make in pasteboard ornaments which we make in plaster; they are more durable; they become loosened with difficulty; and when loosened, the danger is slight and the expense of reparation small." It was in architectural decoration that "papier-maché," or carton-pierre (stone-pasteboard) was first extensively introduced. The interior ornaments of buildings in the Elizabethan style were formerly modelled by hand, in moist plaster laid upon the walls and ceiling. "As this work had to be done on the spot," it has been observed, "and with much rapidity of execution, in order to prevent the stucco from setting before it had acquired the intended form, the art was somewhat difficult; the workman had to design almost as he worked; therefore, to do it well, it was necessary that he should have some of the acquirements and qualities of an artist. This circumstance of course tended very much to limit the number of workmen, and their pay became proportionably large. It was no unnatural consequence that artizans thus circumstanced assumed a consequence that belonged not to their humble rank in life: it is said that they might have been seen coming to their work girt with swords, and having their wrists adorned with lace ruffles." This state of things led to a more independent tone on the part of the workman than was consistent with the rapid execution of work; and the method of modelling gradually gave way to the use of ornaments cast in plaster. This, in its turn, is now giving way to the use of papier-maché, which is only one-sixth as heavy as plaster, and is much less fragile than stone, marble, or wood.

Papier-maché is made of pasteboard and paper prepared in various ways so as to assume the state of a pulp or paste, which is pressed into the moulds or dies destined to give the device. Great improvements have been recently made in the preparation of the material, so as to combine the qualities of toughness and fineness; and the decorations in various parts of the Queen's palace, King's College, the British Museum, the Pantheon, the House of Lords, and many of the club-houses, show how well it has been brought to bear upon architectural design by Mr. Bielefeld. How far it has been or is now being used in the model-mapping process, inventors have not in general stated; but Major Mitchell, when he presented, two or three years ago, a model of the Pyrenees to the United Service Museum, made a remark which shows one application of the substance in connection with models. In a letter to one of the vice-presidents he said (we quote from the 'United Service Journal')—"I beg that no cast may be taken from the model, as this might affect my copyright to those already made in copper and papier-maché."

We may remark, as a curious instance of the connection between model-mapping and medal-engraving (the latter of which subjects was briefly noticed in a recent article), that Major Mitchell's model-map has been engraved by Mr. Bate's machine; so that the hilly districts of the Pyrenees are not only represented by protuberances on the map, but also by the peculiar bold relief-like mode of engraving effected by the "Anaglyptograph"—the somewhat complex name given by Mr. Bate to his machine.

Summer-time of the Swiss Herdsmen.—The real life of the *châlet* is at all times one of labour and hardship; nor must we take our general idea of it from those *châlet-auberges*, as they may be called, that are within the common reach of travellers. In the higher stations, which are not accessible to females, the men, as may be imagined, are altogether wild in their appearance and habits. They live in the most disgusting dirt, amidst smoke within and the manure of the cattle without. The *châlets* in their best state are miserably cold, admitting the wind, from whatever point of the compass it may blow, between the interstices of the trunks of pines of which they are built. The "moveables" consist of nothing but the cauldron and utensils for the milk and cheese, and a large plank for a table: neither chairs nor beds enter into the furniture department: dried grass, about a foot in thickness, seldom changed, and a few coarse woollen blankets on which they lie down night after night, without taking off their clothes, serve for one common couch. In some of the districts the shepherds watch all the first week that their cattle come on the heights, for fear they should fall over the precipices, or wander among the glaciers; afterwards they take it in turn to sleep and watch. In those places where cheese cannot be made on account of scarcity of wood, and the pasturage is in consequence appropriated only to feeding cattle and horses, or, as in the higher Alps, goats and sheep, the herdsmen have no other shelter than the hollows of the rocks, and bivouac in the open air along with the objects of their care. During the forty days the season lasts on those highest heights, the men never taste either bread, meat, or wine: they subsist entirely on milk, which, added to the purity of the air, agrees with them so well, that they always descend into the valleys, after their probation, with a considerable increase of *embonpoint*, and uniformly leave their stormy solitary regions with great reluctance. Where cheese is made, the men generally receive their wages in the material they manufacture, at the rate of about eight pounds per annum English money. They are fond of the cattle, without paying much attention to their comfort. They take no care to protect them from the noontide heats or storms, having no building of any kind to shelter them under; and they suffer them to graze about, straggling as they will, when by a little attention they might make the grass support nearly double the number. They attract the cows at milking-time with salt, of which they give them great quantities; and they ease the labour of milking them by sitting during the operation on little low stools, which they carry for that purpose, ready strapped round the latter end of their persons, producing an effect more characteristic than poetical. The cheeses on the higher Alps are finer-flavoured than those on the lower, on account of the aromatic herbs more abundantly produced there, and which supply the place of salt in the preservation of the cheese.—*Mrs. Strutt's Domestic Residence in Switzerland.*

HONG-KONG.

THIS island has now become an integral part of the British empire, and likely to become also the chief seat of a most important and extensive commerce, destined perhaps to unite in amicable intercourse the three hundred and sixty millions of the hitherto isolated, though certainly not uncivilized Chinese, with the more active and enterprising inhabitants of what we are accustomed to call the civilized world. Peaceful but independent relations with such a country cannot but be productive of reciprocal benefit to all parties, and will, we hope, be henceforward maintained. Our purpose now, however, is to give a short account of the present state of an island in which commerce with its attendant population will probably speedily work extensive alterations.

Hong-Kong is one of a group of rocky islands at the extreme eastern boundary of the estuary of the Choo-kiang or Canton river, and of these it is the most northerly, and nearest to the continent, from which it is divided by a strait varying in breadth from one mile to six. It is situated in lat. 22° 17′ N. and long. 114° 12′ E., about forty miles east from Macao, and about a hundred miles from Canton. It is about eight miles long, and, according to Dr. M'Pherson, two and a half in breadth at its widest part, while K. S. Mackenzie and Captain J. Elliott Bingham speak of its being five miles broad. The island is rocky, and of a forbidding appearance at a distance, but on a nearer examination there are found many rich and fertile portions interspersed, and it is abundantly supplied with good water; indeed its name is a corruption of the Chinese words *Hoong-Keang*, the red torrent, so called from the colour of the soil through which a stream flows, forming a fine cascade from a cliff adjacent to the harbour, into which it flows, affording great facility to ships taking in fresh water.

The number of native inhabitants is variously stated at from one thousand to seven thousand five hundred, but all the recent writers concur in stating the great influx of inhabitants since our possession of it, and one, Captain Bingham, estimates the present number at fifteen thousand.

The most distinguished advantage of this island is its magnificent harbour. Dr. M'Pherson says of it, "The bay of Hong-Kong cannot probably be surpassed by any in the world, not only by reason of the infinite number of ships which it can accommodate, but also of its safe anchorage from typhoons compared with any harbour in China, and the depth of water close to the land, which along the greater part of the bay is sufficient for a seventy-four to float at a distance of a cable's length from shore. From this circumstance alone the island must prove a possession of enormous value as a commercial acquisition. Magnificent granite-quarries are found all over the island, so that warehouses on any scale can be built close to the water's edge, and wharfs with ease thrown out, which will enable ships to approach for the purpose of loading and unloading. There is at all seasons an abundant supply of fresh water procurable on the island.

"In other respects this new colony possesses but few advantages. Its northern side is formed by a connected ridge of mountains, the highest of which is about two thousand feet above the level of the sea. Except in a few spots, these mountains are barren and uncultivated, formed by black projecting masses of granite,

the intervals giving shelter to herbage and brushwood. There are no trees of any size, and, unlike the generality of mountainous districts, it possesses but a few valleys, and these not of any extent. The mountains, for the most part, fall perpendicularly into the sea, thus leaving but little space for building at their base. The interior and south side is chiefly formed by level and undulating land, and appears to be far better adapted for private residences than on the north side. Here, too, there are some very fine bays, the chief of which are Ty-tan and Chuck-pie-wan. At the former place a military post has been established. The latter place, which is about five miles from Ty-tan, forms a very convenient and well-sheltered site for building dockyards, &c. Partridge, quail, and snipe have been found on the island, and in the jungle pheasants and deer have been seen.....A peninsula of considerable size, with only a few Chinese hamlets upon it, extends from the town of Cowloon in a south-easterly direction. This mostly consists of rich level ground..... The appearance of Hong-Kong is anything but prepossessing; and to those who have hitherto resided upon it the climate has proved far from salubrious. There is a good deal of rank vegetation on the face of the hill, the ground on which, after a heavy rain, becomes elastic and boggy. On the Cowloon side of the bay the atmosphere is at all times more pure, and the change of temperature less sudden; indeed altogether it appears a far more likely and preferable spot to form a settlement than on the Hong-Kong side."*

The climate does not indeed appear to be the only danger to be feared, though this, it is to be hoped, may be found to be ameliorated by local situation on a more intimate knowledge of the island; while from the typhoon, the other fearful and more terrific visitant, increased security will probably be obtained by improvements in the harbour through the resources of British engineering art, and on the land from erecting buildings of greater strength and solidity. Dr. M'Pherson arrived at Hong-Kong in February, 1841, and he thus writes of the two evils above mentioned:—

"The climate of Hong-Kong at this period was most variable, the thermometer ranging frequently 10°, 15°, and at times 20°, in the twenty-four hours. The troops were cantoned on the brow of a high hill, from whence cold blasts of wind and heavy falls of rain were in quick succession followed by a burning-hot sun; and the barracks provided for them were wretchedly ill adapted for so changeable a climate. Is it a wonder, then, that disease increased? In the 17th regiment, six hundred strong, barely one hundred men were effective; two of the officers had died, and of the sixteen remaining, one only was fit for duty. In our crowded hospitals, sores of a frightful character made their appearance; these terminated in hospital gangrene. The slightest abraded surface speedily degenerated into a foul, malignant ulcer; wounds received in action at Cheumpee and elsewhere, but which had been cicatrized for days and days, now again broke out. Many poor fellows, proud of their wounds, and rendered thereby disqualified for further effective service, looked forward with pleasure and anxiety to the period of their return to their native homes, where they would be enabled to spend the rest oftheir days in ease and comfort with their families, on the bountiful provision of their honourable masters, were now cut off.

"The corps was exactly in this state, with an hospital crowded to overflowing, when the typhoon of the 21st of July came on. It had commenced about midnight, and continued steadily increasing in violence, and at 6 A.M. it blew a hurricane from the north-west. The hospital of the 37th, which fronted in this direction, was a continued line of building, constructed of bamboo and palmyra leaf, 200 feet long, by 18 broad, into which upwards of 300 men were stowed—an additional hundred having a few days previously been placed on board ship.

"I had about half finished my visit (Dr. M'Pherson was acting as surgeon to the 37th regiment in the expedition), when I observed the side of the building facing the gale evidently yield to the force of the tempest. I immediately directed those of the sick who could move to leave the building forthwith, and was hastening to do so myself also, when suddenly I heard a tremendous crash, and ere I was able to reach the door, with many others, was thrown on my face, and crushed under the wreck of the building. The shrieks and groans of the miserable bed-ridden patients, the howling of the wind, and the crackling of the beams, sounded to me, when I had recovered my consciousness, something more than horrifying, more especially as I was myself deprived, by an intolerable dead-weight upon my shoulders and back, which pressed my chest to the ground, from taking part in it. The ground on which I had fallen was fortunately much softened with the rain, the building having been thrown several feet beyond its original foundation. I was thus enabled, after extricating my arms, and assisted by a sepoy, who was equally anxious with myself to become free, to scrape, or rather burrow, my way out, and tottering to my brother officers' quarters, apprized them of their danger, and announced to them what had already happened.

"By dint of very great exertions on the part of the officers, and the few men who could be procured, the sick were extricated from the wreck of the hospital, and placed in one of the other barracks—alas! merely to have the same scene acted over again. Barrack after barrack was levelled to the ground. The officers' houses followed; their kit was flying about in all directions. The force of the wind tore the very flooring from the sleepers. It was now *sauve qui peut*, for there was danger in remaining in the vicinity of the lines.

"The sea, at all other times in this harbour so still and smooth, was now fiercely agitated, and had already encroached upon the island far beyond its natural bounds. Ships drifting from their anchorages were seen rapidly nearing the shore, while their crews were labouring hard to cut away the masts, their only chance of preservation. Occasionally, as the atmosphere cleared across the bay, several ships could be seen clustered in one spot, giving one another a friendly embrace. Ships of seven and eight hundred tons were on shore, in water which on ordinary occasions is barely knee-deep. Innumerable boats were scattered in fragments on the beach, while underneath and around them were many mangled and lacerated corpses of Chinese.

"At 3 P.M. the typhoon was at its height; the wind and drenching rain continued unabated, and torrents, in form of cascades, poured down the hills, sweeping everything before them. The houses had all been destroyed, and no covering remained to protect from the raging elements. The natives were running wildly about, vainly beseeching succour from their gods. At times masses of loose stone would become separated from the mountains, and roll down the hill like a huge avalanche, threatening destruction to all below. The last days of Hong-Kong seemed approaching. It was a grand but truly awful sight.

"It will be easier to conceive than to describe the helpless and wretched condition in which the inhabitants of this newly-colonized island spent this night.

"On the evening of the 25th and the greater part of the 26th of July, the island was again visited by a typhoon, which, though not so violent as that now

* 'Two Years in China, &c.,' by D. M'Pherson, M.D.

described, swept away all that escaped the gale of the 21st. It destroyed the temporary buildings thrown up, and exposed the wretched inmates a second time to the fury of a dreadful tempest of wind and rain. The losses sustained, both in life and property, by these typhoons, have been fearfully disastrous. The closeness and oppressive nature of the atmosphere some hours previous to their coming on, evidently indicated the approach of a storm; and the native population, who are generally pretty correct in their indications of the weather, foretold, as did also the barometer, on both occasions, that a typhoon might be expected."

Our engraving represents a spot in the island of Hong-Kong, a small valley looking across the bay and upon the adjacent high land of Cow-Loon. The entrance to this part towards the sandy beach is extremely narrow, abounding with rugged and pointed rocks. The centre of the gorge is blocked up by a mass of rocks, which have been cleverly brought into use by the persevering industry of the inhabitants: they have cut out a small canal on the summit, and placing at each extremity a large double bamboo, hollowed out to about a foot and a half or two feet in circumference, have thus established a rude aqueduct, by which the water is conveyed from one place to another from above the valley, and also possesses the advantage of watering other parts, which without it would have been sterile and barren. At first sight it appears like a slight bridge thrown across the defile.

THE EFFECTS OF FOREST-CLEARING ON LAKES AND STREAMS.

M. BOUSSINGAULT, an eminent French naturalist and traveller, drew attention a few years ago to the remarkable effect which the clearing of a forest exerts on the lakes and running streams of a district. In the most cultivated and civilized countries of Europe, the clearing was effected so many ages back, that we have no means of comparing present with past appearances; but in America, where the march of man through the trackless forest is so rapid and so irresistible, the facts and appearances presented might be particularly valuable, if the "go-a-head" progress allowed time for their collection.

It is remarked by M. Boussingault, that an opinion prevails that in those regions where the process of clearing has been extensively carried on, less rain falls than formerly. In some cases the streams which were employed in propelling water-wheels have very sensibly diminished; in other places rivers seem to have become more shallow, apparently by the disappearance of a portion of their waters, since the pebbly beds have come more and more into sight. Such observations have been principally made in valleys surrounded by mountains; and it has appeared to many that these changes have been coeval with the cutting down of large masses of forest. In order to test this matter, M. Boussingault collected much information while residing and travelling in America, and the sum of his details seems to support the general opinion. He selected lakes as the assemblages of water most suited for his observations, since they may be considered as natural gauges calculated to assist in valuing the variations which may take place in the quantities of water fertilizing a given extent of country. If the volume of waters undergo any variation, this variation, whether of excess or diminution, will be indicated by the mean level of the lake: thus the mean level of a lake will fall, if the annual quantity of running-water in the streams of the district diminishes; while, on the contrary, it will rise if these streams become more copious; and will remain stationary if the volume of water which runs into the lake experiences no change.

In the district of Venezuela, in South America, there is a valley so completely surrounded by hills and mountains, that none of the streams and rivers which rise within it can find an outlet, and they therefore form a beautiful lake at its lowest level. This lake, called Tacarigua, was found by Humboldt to be about thirty miles in length by seven or eight in breadth, and elevated thirteen hundred feet above the level of the sea. He was told by the inhabitants of the valley that they had observed the waters of the lake to be gradually diminishing for thirty years. This circumstance induced M. Boussingault to make some investigations into the subject when he was in America. He found that Oviedo, a traveller who spent much time in Venezuela in the last century, mentions the founding of the town of New Valencia in 1555, at a distance of half a mile from this lake; whereas Humboldt found it in 1800 to be more than three miles distant. That the water of the lake had really receded many proofs appeared on investigation. Certain rising grounds, somewhat elevated above the general level of the plains, were still called by the inhabitants 'islands,' as if they had once been surrounded by the waters of the lake. Buildings, which from their nature appear to have been originally built on the margin of the lake, are now far from it. New islands have been known to gradually appear, as if by the recession of the water; and an important military post, built in 1740 on the island of Cabrera, is now on a peninsula. The inhabitants stated to Humboldt their conviction that a subterranean conduit for the waters must exist somewhere; but after an attentive examination he came to the conclusion that the cause of the diminution in the waters of the lake was nothing more than the extensive clearing away of the woods over the whole valley during the latter half of the eighteenth century; and he added—"In laying low the trees which once covered the tops and flanks of mountains, mankind are in all climates entailing, at one and the same time, two great calamities upon succeeding generations: they are producing a scarcity both of wood and water."

Twenty-two years afterwards, Boussingault found this same lake remarkably altered. The inhabitants told him that the waters had not only ceased to subside, but had actually begun to rise again. The lands which had been formerly occupied in the cultivation of cotton were now submerged; and several islands which had been above the water when Humboldt was in America had now become shallows dangerous to navigation. The people, instead of watching with anxiety the gradual disappearance of the lake, were now pondering whether the rising waters were about to overwhelm their property.

Now for Boussingault's explanation of this. During the earlier years of the present century Venezuela was the theatre of many of the bloody contests which marked the struggle on the part of the South Americans to throw off the yoke of Spain. The slaves formerly employed in agriculture had their liberty awarded to them on condition of fighting in the ranks of the Independent army; and hence the wide-spreading cultivation of the country became neglected; the forest-trees, so luxuriant within the tropics, had again in great measure usurped dominion over the regions which the inhabitants had reclaimed with the steady labour of a century. The waters, by being freely exposed to evaporation, and also by being used in irrigation, had sunk low during the period of agricultural industry, but had risen again when forests had been allowed to re-form themselves, and thus check the freedom of evaporation.

Boussingault similarly quotes the instance of a spot in New Granada, where the village of Ubata is situated in the vicinity of two lakes, which formed but one

lake sixty or seventy years ago. The inhabitants have year by year observed the waters to diminish and the shores to extend. "If we inquire in the neighbourhood of Ubata," he remarks, "of any of the old men who in their younger days were devoted to the chase, or if we examine the records of any of the different parishes, no doubt will remain that numerous forests have been there felled. The clearing still goes on; and it is equally certain that the retreat of the water has not ceased, though it does not proceed so rapidly as it was wont to do." The neighbouring village of Fuguena was built quite close to the lake of the same name not far from Ubata: but Boussingault found it three miles distant from the lake; and he also remarked that the neighbouring mountains, which had in former times been clothed with forests, were now almost stripped of trees: this he deemed evidence in support of the asserted connection between these two phenomena.

M. Desbassyns observed a singular circumstance in the island of Ascension, bearing upon this subject. In this island a beautiful spring is situated at the foot of a mountain which was originally wooded. The forests in the course of years were cut down, and the mountain cleared; and it was observed that the spring at the same time gradually diminished, and at length failed. The mountain was at a subsequent period again planted, and after a few years the spring reappeared, became gradually more and more productive, and finally was as copious as ever.

M. Boussingault states that he could not avoid associating these effects in something like the relation of cause and effect, when he visited two districts of South America, about alike in average temperature and in elevation, but very different as to vegetation. In leaving Panama and travelling towards the south into the provinces of San Buena Ventura, Choco, and Esmeralda, he found the country covered with thick forests, furrowed by a multitude of rivers, and subjected to almost incessant rain. In another direction he passed into a district where there were no forests and hardly any vegetation, and here the whole district was so sterile, that sometimes years have been known to pass over without rain falling. It might indeed appear that the circumstance of no rain falling in the one case and abundant rain in the other, was the regulating cause by which the amount of vegetation is determined; but the other instances adduced, in which a change in the vegetation has been followed by, instead of having followed, a change in the supply of rain and springs, show that there is something more involved in the matter.

Saussure's remarks on the Lake of Geneva and the surrounding mountains lead to the conclusion that the waters of that lake were several centuries ago higher than they are now; and this has in like manner been attributed to the gradual clearing of many of the neighbouring forests. On the other hand, many mountains, lakes, and streams, situated in districts not exposed to the woodman's axe, are known to have maintained their wonted character for ages.

M. Boussingault accounts for these changes in three ways. In the first place he expresses his opinion, founded on a wide range of observation, that extensive clearings lessen the amount of rain which falls in a given district; and he expresses a hope that the vast changes now going on in America will not be allowed to pass away without affording materials for placing this matter on a sure basis. In the second place, where the soil is laid more open to the atmosphere by the absence of tall trees, evaporation may go on more uninterruptedly than in the contrary case. And, lastly, where a great extent of land is brought into cultivation for corn and other produce, the regular irrigation of the soil will make a large diminution in the amount of water left unemployed in the streams and lakes. He adds, that the quantity of running-water does not appear to have varied in countries which have not been subjected to any changes arising from the progress of cultivation; and that, independent of their preservation of surface-water, forests husband and regulate their flow.

ON MERCHANTS' MARKS OR SYMBOLS.

Those who have attended to the subject of printing are aware that the early printers were in the habit of appropriating to themselves certain marks or symbols, as a means of determining the identity of their several productions. A similar custom formerly prevailed to a certain extent among other classes of manufacturers and merchants; but the particulars have until lately attracted only a small degree of attention. Mr. Charles Frost, in a paper read before the Hull Literary and Philosophical Society about three years ago, considered the subject in reference to these three questions:—Were merchants' marks used exclusively for commercial purposes? Or did they, under certain circumstances, become indicative of rank in the bearer? If the latter, were they used as substitutes for armorial bearings, or might they consistently be placed upon the same memorial with heraldic shields? The following is an abstract of Mr. Frost's details, with illustrations from other quarters.

In modern times the term 'merchants' marks' is familiar only to mercantile men, who have long been in the habit of adopting certain arbitrary characters or devices to designate the ownership of particular goods, their peculiar manufacture, or the various qualities of their workmanship. Some of these vocabularies and characters are so peculiar as to be utterly unintelligible beyond the sphere of their immediate application, and often appear very ludicrous to the uninitiated. In all cases the reliance placed upon them is most implicit, and from the foreign and wholesale commerce of the greatest mercantile houses, down to the more humble retail-dealer, any violation of good faith in the employment of them cannot but be attended with prejudicial consequences. Whenever such a violation occurs, it is regarded both as an invasion of a private right and a fraud upon the public.

The law of England has thrown its protection over these symbols for commercial purposes, by extending its aid to prevent their piracy. An instance of judicial recognition of the right of individuals to assume exclusively peculiar marks occurred so early as the twenty-second year of Elizabeth's reign, in a case which was explained by Mr. Justice Doddridge thus:—"An action was brought upon the case in Common Pleas, by a clothier, that whereas he had gained reputation by the making of his cloth, by reason whereof he had great utterance, to his great benefit and profit; and that he used to set his mark to his cloth, whereby it should be known to be his cloth, and another clothier, perceiving it, used the same mark to his ill-made cloth, on purpose to deceive him; and it was resolved that an action did well lie." In more recent instances courts of equity, as well as of law, have supported the principle of this decision. One or two instances of this may be interesting. In an article in a recent volume of the 'Law Magazine,' an account is given of a case in which it was proposed to inquire whether a particular mark belonged to the manufacturer or to the manufactory wherein his goods were produced. The mark 'M C' had long been used to distinguish tin manufactured at particular works in Carmarthen. After a time the lessee of these works removed to other tin-works about forty miles distant, and continued to use the mark 'M C' at the latter

works during several years, while the Carmarthen works were unoccupied. Afterwards another person took the Carmarthen works, and commenced using the same mark on tin manufactured there; a course which the former lessee resisted, on the plea that the mark belonged to him. The ultimate decision of the Lord Chancellor, when this matter was submitted to him, was, that although the manufactory had been some time unoccupied, the mark belonged to it rather than the former lessee, and therefore the second lessee had a right to use it.

In another case, the proprietors of the London Conveyance Company applied for an injunction against an omnibus proprietor, who began to run an omnibus on the same line of road, inscribed with similar words, such as 'Conveyance Company,' &c., and having certain other symbols which were imitations of those on the Company's omnibus. The decision of the equity judge supported the principle that this imitation of mercantile symbols could not be permitted.

There are many circumstances which indicate that in the fourteenth, fifteenth, and sixteenth centuries a large measure of respect was paid to 'merchants' marks,' insomuch that they were considered of sufficient importance to be worthy of a place not only on the fronts of houses, but in painted glass, upon tombstones, and on ornamental brasses. In an article in No. 61 of the 'Edinburgh Review,' it is stated that "In their inscriptions, and in the rubrics of their books, the Spanish Goths, like the Romans of the lower empire, were fond of using combined capitals —of *monogrammatising*. This mode of writing is now common in Spain on the sign-boards and on the shop fronts, where it has retained its place in defiance of the canons of the council (of Leon). The Goths, however, retained a truly Gothic custom in their writings. The Spanish Goth sometimes subscribed his name; or he drew a *monogram*, like the Roman emperors; or the sign of the cross, like the Saxon; but not unfrequently he affixed strange and fanciful marks to the deed or charter, bearing a close resemblance to the Runic or magical knots, of which so many have been engraved by Peringskiold and other northern antiquaries." In a passage in Jackson's 'History of Wood Engraving,' it is remarked, in connection with this subject, that many of the merchants' marks of our own country, which so frequently appear on stained glass-windows, monumental brasses, and tombstones in the fourteenth and two following centuries, bear a considerable likeness to the ancient Runic monograms, from which it is not unlikely that they were originally derived. "The English trader was accustomed to place his mark as his 'sign' in his shop-front, in the same manner as the Spaniard did his monogram: if he was a wool-stapler, he stamped it on his packs; or if a fish-curer, it was branded on the end of his casks. If he built himself a new house, his mark was frequently placed between his initials over the principal doorway, or over the fire-place of the hall. If he made a gift to a church or a chapel, his mark was emblazoned on the windows beside the knight's or the nobleman's shield of arms; and when he died his mark was cut upon his tomb." Mr. Jackson gives cuts of the 'marks' of three individuals: the one being that of Adam de Walsokne, who died in 1349; the second that of Edmund Pepyr, who died in 1483; and the third unknown: the first and second were copied from tombs in St. Margaret's Church, Lynn; and the third from a window in the same church. These marks (which are certainly most unmeaning, or at least unintelligible devices) were copied from Mackarel's 'History of King's Lynn;' a book which contains upwards of thirty more of a similar kind, from the middle of the fourteenth century to the latter end of the seventeenth.

In 'Pierce Plowman's Creed,' written towards the end of the fourteenth century, there occurs a verse in which merchants' marks are mentioned in connection with the window of a Dominican convent:—

> "Wide windows, y-wrought, y-written full thick,
> Shining with shapen shields, to shewen about,
> With *marks of merchants*, y-meddled between,
> Mo than twenty and two, twice y-numbered."

It has been stated that no other two counties in the kingdom contain so many existing specimens of merchants' marks, in connection with monumental brasses, as Norfolk and Suffolk. The late Mr. Samuel Woodward of Norwich collected fifty-three of these, which he offered to the Antiquarian Society for publication, but which we believe are now in the hands of Mr. Dawson Turner. In these and most similar cases the marks engraved on monumental brasses seem to have been those of persons ranking more or less as "merchants;" and it has been asked, "supposing that under any circumstances the mark of the merchant could be used in such a manner as to indicate his rank in society or his importance in the commercial world, why should not the printer's marks, which were equally exclusive, and which have given rise to much ingenious learning and speculation, as well as the marks adopted by various other traders, have also been recorded in testification of the celebrity of those who had acquired good report in their immediate calling, in the exercise of which the use of peculiar symbols had become necessary?" In reference to this point a remark has been made in the introductory essay prefixed to Cotman's 'Engravings of Sepulchral Brasses in Norfolk and Suffolk,' to the effect that merchants or burgesses were probably the only class of laymen, except the military, represented on monuments, and that such monuments are chiefly to be found in borough-towns or the parochial churches where the woollen manufacture flourished.

Mr. Frost, after examining the monumental brasses exhibited in many of our churches, gives numerous examples to show that merchants' marks were not merely employed for the convenience of trade, but that they acquired character, and became entitled to attention and respect, in proportion as those by whom they were adopted accumulated wealth and obtained rank in society. And it is perhaps no matter for surprise to find the prosperous merchant desirous of transmitting to future ages, along with his name, the device he had chosen to be associated with it in his various commercial transactions.

There are other buildings more appropriate than churches in which merchants' marks have been found as expressive of honour and respect to the individual to whom they belonged. Thus, in St. Mary's Hall at Coventry, which was erected in the early part of the reign of Henry VI. for the accommodation of the merchants' guild and other fraternities of the city, there is a large room in which an angel is represented holding a shield, on which is depicted a mark or monogram, supposed to be a merchant's mark; and in the great hall of the same building is a painted window, on which is represented a man with a forked beard and a red cap and gown, and below him a shield bearing a merchant's mark and a scroll, designating him to be William Whychirch, who was mayor of Coventry in the year 1400. Other windows of the same hall contain similar indications of this practice.

The evidence collected on this point seems to lead to the conclusion that merchants' marks were in former times regarded as something more than mere commercial symbols, that they were regarded by the possessors as an honorary distinction analogous to the heraldic bearings of the noble.